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EXAMINER

YAO, SAMCHUAN CUA

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/529,391

Applicant(s)

HAGGARD ET AL.

Examiner

Sam Chuan C. Yao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6-21 and 136 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6-21 and 136 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 136 is rejected under 35 U.S.C. 103(a) as being unpatentable over the current state of the art as evidence from anyone of (JP 2-182962, JP 5-140849, Dugan (US 6,461,729), and Marmon et al (US 6,200,669)) in view of Mizoe et al (US 5, ,926), Kurata et al (US 3,928,958) and (Mathes et al (US 4,369,156).

The current state of the art, as evidence from the teachings of anyone of (JP '962 (abstract, figures 1 and 4), JP 5-140849 (abstract; figures 1-5), Dugan (abstract; col. 7 line 7 to col. 8 line 40; col. 11 lines 3-20; figure 4), and Marmon et al (col. 4 lines 5-29; col. 11 lines 10-44; figures 1-7)), continuously produces a non-woven fabric from readily splittable spun-bond multi-component filaments. The continuous process comprises extruding an array of multi-component filaments using a spinneret, each fiber including 1st and 2nd materials, the materials being different from each other; depositing the multi-component filaments onto a moving forming surface to form a web; subjecting the moving web to a hydro-entangling operation to split the multi-component filaments; and, bonding the web to form a nonwoven fabric.

The current state of the art does not teach forming splittable multi-component fibers, each fiber comprising 1st and 2nd materials having a relative difference in heat shrinkage of at least about ten percent, and splitting the fibers in a web by subjecting the web to heat such as hot-air, steam, radiant heat, etc. However, it would have been obvious in the art to heat-treat a web comprising multi-component fibers to open the splittable fibers, wherein the components in the multi-component fibers have differential thermal shrinkage, because: Mizoe et al teaches heat-treating multi-component splittable fibers having components in the multi-component fibers with difference in rate of heat-shrinkage as an effective alternative to splitting multi-component fibers by either high-pressure water jetting or needling operation (col. 5 lines 16-59). Moreover, it would have been obvious in the art to use two incompatible polymers having a relative difference in heat-shrinkage of at least about 10 percent, because: a) one in the art reading the teachings of Mizoe et al as a whole would have readily recognized and appreciated that, the higher the difference in heat-shrinkage rate between components in multi-component fibers, the more readily the multi-component fibers split when they are subjected to a thermal treatment; b) it is well known in the art to form multi-component fibers where the difference in heat-shrinkage in components of the multi-component fibers can be as high as 40% as exemplified in the teachings of Kurata et al (col. 3 lines 26-33); and c) it is old in the art to use form splittable multi-component fibers, where a difference in shrinkage in components of the multi-component fibers is at least 10% so that the multi-

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component fibers effectively split when they are subjected to a fibrillation treatment as exemplified in the teachings of Mathes et al (col. 2 lines 5-22; claim 1). The incentive for one in the art to modify the process of the current state of the art would have simply been to obtain a self-evident advantage of obviating need to provide a collection means to store and discharge large stream of injected water for recycling and need to heat-dry a wet (hydroentangled) web.

3. Claim 136 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizoe et al (US 5,790,926) in view of the current state of the art as evidence from anyone of (JP 2-182962, JP 5-140849, Dugan (US 6,461,729), and Marmon et al (US 6,200,669) and futher in view of Kurata et al (US 3,928,958) and (Mathes et al (US 4,369,156).

Mizoe et al (US 5,790,926) discloses multi-component spinning two different and incompatible thermoplastic resins to form multi-component splittable fibers, wherein heat-shrinkage of the thermoplastic resins is different relative to each other; heat-treating the multi-component splittable fibers to open or split multi-component fibers (col. 5 lines 16-59).

Mizoe et al does not expressly teach using two thermoplastic resins where a relative difference in heat shrinkage of the thermoplastic resins is at least 10%. In addition, it is unclear whether Mizoe et al envisions splitting multi-component fibers in a web in-line.

However, it would have been obvious in the art to use two thermoplastic resins where a relative difference in heat shrinkage of the thermoplastic resins is at least 10%, because because: a) one in the art reading the teachings of Mizoe et

al as a whole would have readily recognized and appreciated that, the higher the difference in heat-shrinkage rate between components in multi-component fibers, the more readily the multi-component fibers split when they are subjected to a thermal treatment; b) it is well known in the art to form multi-component fibers where the difference in heat-shrinkage in components of the multi-component fibers can be as high as 40% as exemplified in the teachings of Kurata et al (col. 3 lines 26-33); and c) it is a common practice in the art to use form splittable multi-component fibers, where a difference in shrinkage in components of the multi-component fibers is at least 10% so that the multi-component fibers effectively split when they are subjected to a fibrillation treatment as exemplified in the teachings of Mathes et al (col. 2 lines 5-22; claim 1). Moreover, it would have been obvious in the art to split multi-component fibers in a web in-line, because: a) the current state of the art split multi-component fibers in a web in-line by subjecting the web to a hydroentangling operation as evidence from the teachings (JP '962 (abstract, figures 1 and 4), JP 5-140849 (abstract; figures 1-5), Dugan (abstract; col. 7 line 7 to col. 8 line 40; col. 11 lines 3-20; figure 4), and Marmon et al (col. 4 lines 5-29; col. 11 lines 10-44; figures 1-7); b) Mizoe et al teaches heat-treating multi-component splittable fibers having components in the multi-component fibers with difference in rate of heat-shrinkage as an effective alternative to splitting multi-component fibers by either high-pressure water jetting or needling operation (col. 5 lines 16-59).

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4. Claims 1-2, 6-14, and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references set forth in numbered paragraph 2 or 3 above as applied to claim 136 above, and further in view of Ishiyama et al (US 6,063,717) or Radwanski et al (US 4,931,355).

With respect to claims 1-2, 16-17, 20-21, it is unclear what is the operating speed of the continuous in-line process disclosed by the current state of the art.

However, it would have been obvious in the art to operate at a speed of at least 30 m/min. as such is conventional in the art as evidence from the teachings of Ishiyama et al (col. 3 lines 50-54; col. 6 lines 37-40; col. 8 lines 19-24) or Radwanski et al (col. 7 line 35 to col. 8 line 68; col. 9 lines 61-66; figure 1).

With respect to claim 6, see column 5 lines 46-50. All that would have been needed would have been to use multi-component fibers, where the difference in rate of heat-shrinkage in the components of the fibers is relatively large and optionally use multi-component fibers having ²large surface area such as a ribbon-like structure.

With respect to claims 7-9, it is well known in the art to form in-line splittable multi-component filaments having a thin rectangular/ribbon structure having alternating components so as to provide a higher surface area that can be exposed to a split-inducing medium (i.e. heat). Also see figure 1C of the Dugan patent.

With respect to claims 10-11, see figures 2-5 of the Midkiff patent.

With respect to claims 12-14, one in the art would have determined a workable heating time in order to ensure an effective splitting of fibers is achieved. The heating time clearly depends on the degree in the relative difference in thermal shrinkage between a pair of incompatible polymers and the structure of the fibers.

With respect to claim 18, the limitation in this claim is notoriously well known in the art for attenuating fibers extruded from a spinneret.

With respect to claim 19, see column 5 line 59 to column 6 line 14 of the Midkiff patent.

Allowable Subject Matter

5. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: none of the references taken teaches using the particular components recited claim 15.

Response to Arguments

6. Applicant's arguments with respect to claim 1 has been considered but are moot in view of the new ground(s) of rejection.

While it maybe true that the Kurata patent does not teach heat-treating twisted yarns in-line with a fiber extrusion process, the Kurata patent is merely cited to show that, it is known in the art to combine components of a spun yarn where the

component heat-shrinkage difference can be as high as 40%, as correctly noted by Counsel.

Conclusion

7. Tsujiyama et al (US 6,309,377) is cited as further evidence showing splittable multi-component fibers having cross shaped configuration (figure 3).
8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Chuan C. Yao whose telephone number is (571) 272-1224. The examiner can normally be reached on Monday-Friday with second Friday off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sam Chuan C. Yao
Primary Examiner
Art Unit 1733

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